## REMARKS

### *Specification*

The objections to the specification are believed overcome in view of the above amendments.

### *Claims in general*

Claims 11 and 12 have been amended so as to distinguish the obtained invention from the cited references.

### *Rejection of Claims 11, 13-14 under 35 USC § 102(e)*

Claims 11 and 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by *Ho et al.* (US 6,507,104 B2).

The instant invention, as claimed in amended claim 11, is directed to a method of forming a flip chip package attached on a substrate provided with a plurality of contact pads, the method comprising the following steps: providing an IC chip having a plurality of first solder bumps on a lower surface thereof and *a plurality of pads on an upper surface thereof*; providing a heat sink having a plurality of second solder bumps formed thereon; placing the IC chip on the substrate such that the first solder bumps of the IC chip are aligned with the contact pads of the substrate; *placing the heat sink on the IC chip such that the second solder bumps of the heat sink are aligned with the pads of the IC chip*; and reflowing the first and second solder bumps so as to

securely attach the IC chip to the substrate and securely attach the heat sink to the IC chip *at the same time*.

*Ho et al.* disclose a semiconductor packaging method that includes the following feature: the semiconductor chip 31 (referring to FIG. 4D) and the heat sink 33 *are respectively positioned on the substrate 30* by simultaneously reflowing the solder bumps 32 and the connecting bumps 34 over the corresponding solder pads 302, 303 of the substrate (referring to column 4, lines 51-55). The features of the *Ho* method are different from those of the claimed invention in that *the connecting bumps 34 of the heat sink 33 are attached to the ball pads 303 of the substrate 30 rather than the pads of the IC chip* as recited in amended claim 11. It is apparent that *Ho et al.* fail to teach the claimed step of *placing the heat sink on the IC chip such that the second solder bumps of the heat sink are aligned with the pads of the IC chip* (as recited in amended vlaim 11). Therefore, amended claim 11 is not anticipated by *Ho et al.* (US 6,507,104 B2).

Claims 13-14 are not anticipated by *Ho et al.* for at least the reason advanced with respect to amended claim 11 from which they depend.

***Rejection of Claims 11-14 under 35 USC § 103(a)***

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Smith* (US 6,437,240 B2) in view of *Ho et al.* (US 6,507,104 B2).

*Smith* discloses a method of making a microelectronic assembly (referring to FIG. 25) which includes a dielectric sheet 1512 with a plurality of contacts 1519, a semiconductor chip 1524a with a plurality of solder bumps 1550a, a semiconductor chip 1524b with a plurality of solder bumps 1550a, a element 1580, and a heat sink 1542 with a plurality of solder bumps 1550b. *Smith* expressively requires that the solder bumps 1550a and 1550b be *sequentially*

*reflowed* (referring to column 30, line 42 to column 31, line 39). Further, *Smith* also teaches that the melting temperature of the solder bumps 1550b may be different than that of the solder bumps 1550a, and that the higher temperature melting bumps are placed first and frozen and the lower temperature melting bumps are then placed and melted (referring to column 32, lines 1-8). Accordingly, *Smith* teaches away from the step of *reflowing the first and second solder bumps so as to securely attach the IC chip to the substrate and securely attach the heat sink to the IC chip* ***at the same time*** (as recited in amended claim 11).

In addition, *Ho et al.* disclose a method of making a semiconductor package; however, the structure of the semiconductor package made by the *Ho* method is different from that of the claimed invention since *the connecting bumps 34 (referring to Fig. 4D) of the heat sink 33 is attached to the ball pads 303 of the substrate 30, rather than the pads of the IC chip* 31 as recited in amended claim 11.

In view of the above, a person of ordinary skill in the art would not have combined the methods of *Smith* and *Ho et al.* to arrive at the claimed invention since *Smith* teaches away from the Examiner's proposed combination, and *Ho et al.* teach a different package structure from that made by the steps recited in amended claim 11.

Therefore, claim 11 is nonobvious over *Smith* and *Ho et al.* If an independent claim is nonobvious under 35 USC 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Claims 12-14 depend from independent claim 11, and thus the citations fail to render claims 12-14 unpatentable.

***Rejection of Claims 11 and 15 under 35 USC § 103(a)***

Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Wu* (US 5,777,385) in view of *Ho et al.* (US 6,507,104 B2).

*Wu* discloses a method of making a package structure (referring to FIGs. 2-3) which includes a substrate 14, IC chip 27 with a plurality of solder bumps 29, and a heat spreader 21 with a plurality of solder bumps 25. *Wu* expressively requires that IC chip 27 be first joined to the substrate 14 by a heat reflow, and heat spreader 21 is subsequently joined to IC chip 27 by another heat reflow (referring to column 4, lines 2-5), which is quite different from the last step recited in amended claim 11.

In addition, *Ho et al.* disclose a method of making the *Ho* semiconductor package; however, the structure of the semiconductor package made by this method is different from that of the claimed invention since *the connecting bumps 34 (referring to Fig. 4D) of the heat sink 33 is attached to the ball pads 303 of the substrate 30, rather than the pads of the IC chip* 31 as recited in amended claim 11.

In view of the above, a person of ordinary skill in the art would not have combined the methods of *Wu* and *Ho* to arrive at the claimed invention since *Wu* teaches away from the Examiner's proposed combination, and *Ho et al.* teach a different package structure from that made by the steps recited in amended claim 11.

Therefore, claim 11 is nonobvious over *Wu* and *Ho et al.* If an independent claim is nonobvious under 35 USC 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Claim 15 depends from independent claim 11, and thus the citations fail to render claim 15 unpatentable.

Based on the above remarks, the amended claims are believed patentably distinguishable over the cited references. Reconsideration and withdrawal of the rejections and objections are respectfully requested. Allowance of pending claims 11-15 is solicited so that the entire case may be passed to early issuance.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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